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ORIGINAL CONTRIBUTION

The Effects of Women's Health Nursing Section Team Based Learning on Self-Directed Learning Ability, Learning Attitude and Problem Solving Ability

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Abstract— This study aims to develop a Section Team Based Learning (STBL) program for women health nursing education for undergraduate nursing students. It also intends to investigate the effects of the STBL on self-directed learning ability, learning attitude and problem solving ability. The participants(n = 69) were 34 people in an experimental group and 35 in a control group. A quasi-experimental nonequivalent control group pre/post-test design was used. Data were collected from the experimental group and the control group between September and October of 2017. This study was performed after obtaining approval by IRB (Institutional Review Board) and an agreement by the objects. The women's health nursing STBL program was operated by a researcher personally and run for 50 minutes per week over six weeks in total. It measured self-directed learning ability, learning attitude and problem solving ability of the participants before and after the program. As a result, it has shown that the STBL program exerted a significant influence on the problem solving ability for women health nursing learning (p < 000), but not on the self-directed learning ability and the learning attitude. Therefore, college education courses seem to need to be supplemented in order to foster outstanding and problem-solving nursing resources. The women's health nursing STBL program will be helpful to improve problem solving ability of nursing students rather than a lecture class. It will also increase self-learning ability of the nursing students.

Index Terms— Section Team Based Learning (STBL), Self-Directed Learning Ability, Learning Attitude, Problem Solving Ability

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Introduction

Due to rapid changes in society, the age at marriage is getting late (Oh, 2015; Yang & Moon, 2007). Also, females get to have low levels of health and tend to avoid or delay their marriages and childbirth for their economic activity. Under the social structure and situation, females hardly feel well-being (Song, 2013; Siriwato & Poonyarith, 2016). For these reasons, high capability for women health nursing is required in the nursing field. Nurses for women health nursing are expected to be a person of problem solving instead of simple knowledge acquisition (Dong, 2016; Yang & Moon, 2007). As a method of training such a problem solving human resource, women's health nursing STBL is operated and investigated its effects on self-directed learning ability, learning attitude and problem solving ability.

Nursing education is a process to develop capability to apply knowledge, skills, attitude and value needed for a nursing profession. It includes various types of learning such as lectures, tutorials, workshops, seminars, practice (Chan, 2002; Safitri et al., 2017). However, a lecture class as traditional education is a type to utilize information delivery media in the uniform environment. This education method deteriorates interaction between students and self-directed learning ability (Baek et al., 2011; Balcom, 2015). Self-directed learning means that students are in charge of analyzing, planning and evaluating a learning process on their own initiative (Michaelsen et al., 2004). An advisor should figure out learning types and tendencies of students in the process of collaborating and provide them with information about proper materials and learning strategies. During the process, the advisor should help students maintain and enhance self-directed learning ability (Ha, 2011).

Particularly, self-directed ability in a clinic is very crucial because it can increase job satisfaction and intensify an active clinical approach by acquiring knowledge and skills personally (Yang & Moon, 2007). Group cramming education decreases adaptability, judgment and problem solving ability in the nursing environment. It is a concerned phenomenon that self-directed learning ability of upper grade students gets worse than that of lower graders (Ha, 2011). Thus, teaching methods have to be changed and improved consistently in the learning field of undergraduate nursing students.

Recently, problem solving ability is being demanded steadily in the women health nursing clinical field. Team Based Learning (TBL) can be used to advance critical thinking ability and interpersonal relationship ability to cope with diverse health problems. TBL is a learning model that an advisor enables all students to participate in class of team learning and discussion (Choi & Park, 2014). By small group activity for active learning, students can cooperate with peers and focus on learning in the

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process of debating suggested subjects (Michaelsen et al., 2004). These day, TBL activity is also being implemented in nursing education and can have a positive effect that nursing students can rediscover their learning ability (Lee & Jung, 2014). TBL can maximize effectiveness based on advisor's preparation and passionate instruction. On the other hand, TBL without perfect preparation may be a burden on an advisor and students. Departing from the traditional TBL standardized process, an easily operated program like women's health nursing STBL needs to be developed. Women's health nursing STBL is a partially modified teaching model to draw self-directness and problem solving ability from students. It suggests a lighter and more structuralized format than the existing TBL. And, it also supplies basic materials to women health nursing education and helps foster professional human resources in the future by investigating its effects on self-directed learning ability, learning attitude and problem solving ability.

Literature Review

TBL

TBL is a learning method which has been run in many places for a long time. This is based on a small group and prepared with class materials at home. It is a teaching strategy to evaluate preparation in class and operate group performance and peer assessment basically (Cho & Lee, 2008; Niamhom et al., 2018). When a group is formed properly, an instructor checks thoroughly and gives clear and prompt feedback and students acquire learning contents by repeating challenging assignments for a cohesive group. They learn how to utilize learning contents and interact with peers, which can maintain progressively after completing the course (Michaelsen et al., 2004). A special function of TBL by Michaelsen et al. (2004) is to help become a learning team to yield the best outcome. TBL should be designed to provide teams with an opportunity to take part in a meaningful learning course. It has a special order of preparation, utilization and assessment stages.

In the preparation stage, students carry out a reading task of one unit, which just gives information and ideas of a subject. They get to take part in RAP (Readiness assurance process) in class. They do all the activities by answering questions, solving problems, understanding meanings and predicting in the utilization stage. An instructor compares each group's answers and provides feedback on their questions. The last thing is class assessment, which is an interdependent learning process of class activities and extra class activities.

The core principle of TBL by Michaelsen et al. (2004) is to form a group with members on a similar level. Students should recognize responsibility for their learning and have confidence in results. In the group learning process, proper feedback should be given while individuals and group members are communicating. Immediate feedback can promote students' various thoughts and lead to successful TBL.

When a group becomes cohesive through TBL activities, students can learn how to utilize learning contents. Besides, when prompt and clear feedback on team activities is provided, they can learn how to interact with each other. With repeated challenging assignments, students can develop self-directed learning ability continuously after the process is completed (Lee & Jung, 2014).

Self-directed learning, learning attitude and problem solving ability

Self-directed learning ability can help students judge learning requirements, set up learning goals and implement learning strategies with the initiative in learning. It means a learning habit to analyze and supplement outcomes. Nowadays, colleges are operating e-learning programs with the Internet and digital technologies thanks to development of information and communication. This offers student centered interactive learning in the open and flexible environment. So, people can form a learning community and make use of it anytime and anywhere (Cha & Kim, 2014). An ability to manage self-directed learning to accept new information and improve oneself is much more important than an instructor centered passive class (Shin, 2015). The instructor-led class can deliver a large amount of knowledge for a short period. However, students do not have the initiative in learning and cannot find an active learning method by themselves. It may cause a concerned problem that their ability of field application and generalization can be deteriorated as a knowledge based society member (Cha & Kim, 2014).

Learning attitude means physical and mental postures to respond consistently to learning (Kim, 2002). This is a motivation for doing a special activity and an active behavior pattern habit beyond class attitude. Such an active learning attitude gives consistent influence on learning activities. Learning attitude is a predictor to plan and perform self-directed learning ability and has a positive relationship with self-directed learning ability (Ha, 2011). As a positive awareness of learning value is high, it forms good learning attitude and has a big impact on learning participation (Kwon & Yoon, 2009). So, an instructor should help learners improve learning attitude by inducing their motivation and value and learn initiatively by raising their expectation. Mostly self-directed learning attitude and problem solving ability can be shown in the same environment.

Polya (2005) saw that problem solving ability means a process to resolve a problem initiatively without knowing a solution in advance. He told that in this stage learners can improve their problem solving ability by understanding problems, planning, proceeding and analyzing outcomes. An element to recognize goals and challenge sprits is regarded as a predictor to improve problem solving ability. Especially, a student who uses self-monitoring strategies a lot has high problem solving ability (Kim, 2002). Kim (2002) said that main factors, such as intelligence score, discussion, preference, curiosity, self-acknowledgement, family income, can affect problem solving ability and as these factors are high, problem solving ability is also high. In particular, an intelligent characteristic factor is the most influential thing among them. Thus, the problem solving ability of genius students is higher than that of ordinary students. As students are acknowledged much by friends and family and as their happiness is high, their problem solving ability is high accordingly. And, an instructor and students are eager for recognition from each other, which helps improve self-directed learning ability and problem solving ability (Lee & Jung, 2014). Although college nursing students are learning STBL education, an instructor and students are having difficulty in utilizing it. This study of STBL was divided into 6 steps and developed for easy application as a structuralized process. Through the STBL learning course, an instructor and students will build up a close relationship and their self-directed learning will get to improve.

Methodology

Research model

A research design is aimed to figure out the effects of women's health nursing STBL on self-directed learning ability, learning attitude and problem solving ability. This study is a nonequivalent control group pre/post-test design as a quasi-experimental research.

Research objects

Objects of this research were 3rd grade nursing students from different colleges in a region by convenience sampling. They were assigned by experimental and control groups and agreed to join the research in writing. 26 people respectively of 2 groups were verified by significance level (α) = .05, group number = 2, power = .90, effect size = .80 of Cohen

(1988)'s Power Analysis, so 30 people of each group were selected. The experimental group was run for 50 minutes weekly by 6 times total and included the objects who completed more than 80% and excluded less than 80%. While the experimental group was intervened, the control group also took pre/post-tests.

Table I
Research design

Group	Pre-Test	Treatment	Post-Test
Cont.	Y1	-	Y2
Exp.	Y1	X	Y2

Cont: Control group, Exp: Experimental group
Y1: General Characteristics, Self-directed Learning Ability, Learning Attitude, Problem Solving Ability
Y2: Self-directed Learning Ability, Learning Attitude, Problem Solving Ability; Women's Health Nursing STBL 50 minutes, * 6 times

The objects who joined the final analysis were 34 people of the experimental group and 35 people of the control group. In fact, the experimental group participants were originally 35 people at the beginning but 1 person was excluded because he omitted the questionnaire partially.

Research intervention
Development process of program

In this study, women's health nursing STBL program has been developed with reference to nursing education TBL (Baek et al., 2011; Kang et al., 2013; Roh et al., 2012; Shin, 2015) from the learning model which Michaelsen et al. (2004) suggested. The TBL model of Michaelsen consists of prerequisite learning, learning readiness, individual and team tests, team cooperation learning for concept application and team performance assessment. STBL has 6 stage activities. In the 1st stage, individual prerequisite learning is done. In the 2nd stage, individual readiness test for prerequisite learning is done. In the 3rd and 4th stages, one person in a team makes a presentation of prerequisite learning contents. During the process, students check what they lack in the prerequisite learning and readiness test and resolve a team cooperation test through questioning and a debate. In the 5th and 6th stages, an advisor returns marked individual and team tests to students and explains test summary and asks for peer assessment.

Ethical protection of objects

For ethical protection of the objects, this research was implemented after obtaining K College's IRB(Institutional Review Board) approval number: GU-IRB-005. The research objects agreed to this study and listened to explanation of research purpose and participation method. They fully understood guarantee of anonymity, voluntary participation, possibility of quitting midway. And they received compensation.

Application of women's health nursing STBL

For the program application, a researcher intervened the experimental group firsthand for the 6 weeks from September of 2017. Before the intervention, the researcher determined prior self-directed learning ability, learning attitude, problem solving ability and at the same time conducted the survey of the control group which took instructor-led education. Women's health nursing STBL was operated for 3rd grade nursing students as attendees for 50 minutes weekly by total 6 times. The curriculum of STBL deals with pregnancy and childbirth. The concrete operation process is as follows.

1st stage: Individual prerequisite learning – Prerequisite learning is to set a student a task by small unit and recommend preparation at home. During the process, one person prepares a presentation of the small unit contents for teammates. 2nd stage: Prior individual test – 5 8 questions are tested to check preparation learning through an individual test. A professor grades the tests. 3rd stage: Presentation in a team and discussion – A team is formed by 4 5 members and a speaker presents the prepared contents to team members. They ask questions and debate after paying attention to the presentation and can get additional points of peer assessment according to their question numbers. 4th stage: Team test – When the team presentation is finished, the professor provides team members with the pre-tests and post-tests and members solve them by debating together. 5th stage: The whole discussion and problem solving – The professor marks team question tests and returns individual readiness tests and team question tests to members. They receive and check their incorrect answers through discussion. The professor explains the tests and summarizes main contents of the small unit. 6th stage: Assessment and introduction of next class – Assessment of teammates is processed to combine individual test scores with peer assessment. The professor introduces next class unit and designates a next presenter accordingly. When the STBL program is completed, self-directed learning ability, learning attitude, problem solving ability of the experimental group should be measured for post-test and those of the control group who takes a lecture class should be measured at the same time.

Research Tool
STBL

STBL is a teaching learning type which was developed by modifying and supplementing the widely used existing TBL easily and concretely. It provides learners with a leading role by selecting some portion of one semester course. Individual prerequisite learning is done in the 1st stage and review is done through team member's presentation, explaining materials and discussion in the 3rd stage. This is a learning method developed to accomplish mastery learning through key point summary in the 5th stage.

Self-directed learning ability

It was developed to determine problem solving ability of college students by Korea Educational Development Institute (Kim, 2002). It consisted of 3 ability elements of learning plan, learning practice, learning assessment and their subelements respectively, which used 40 questions total. According to 5 point scale of Likert type which ranges from 1 point of 'not at all' to 5 point of 'always yes', it represents that the higher the score is, the higher self-directed learning ability is. The inverse questions of this tool were 1-1, 4-5, 6-2, 6-4, 6-5, 7-2, 7-5 and Chronba α was .92 when the tool was developed and reliability of this study, Chronba α was .811.

Learning attitude

Out of 40 questions of a learning attitude measurement tool, which was developed to evaluate learning attitude including college student's habit, belief, motivation by (Sung et al., 1987) of Korea Educational Development Institute, finally 16 questions were used after removing repeated questions and revising terms in accordance with nursing characteristics on the basis of (Hwang, 2003) pedagogy thesis consideration. The learning attitude measurement tool, which had 3 subelements of self-conception (questions 1, 2, 3, 4, 5), learning attitude(questions 6, 7, 8, 9, 14, 15), learning habit (questions 10, 11, 12, 13, 16), was measured by 5 point Likert scale. It is scored from 1 point of 'not at all' to 5 point of 'always yes' and

negative questions (2, 5, 11, 15) are inversely processed. It represents that the higher the score is, the better learning attitude is and reliability of this study, Chronba α was .716.

Problem solving ability

It was developed to measure college student's problem solving ability by Korea Educational Development Institute (Kim, 2002). It consisted of 5 ability elements of question clarification, cause analysis, alternative development, plan, practice performance assessment and their subelements respectively, which used 45 questions total. According to 5 point scale of Likert type which ranges from 1 point of 'not at all' to 5 point of 'always yes', it represents that the higher the score is, the higher problem solving ability is. The inverse questions of this tool were 2-2, 2-3, 2-5 in a data collecting area of cause analysis and Chronba α was .94 when the tool was developed and reliability of this study, Chronba α was .889.

Results and Discussion

Data were confirmed by descriptive statistics which showed average and percentage of objects' general characteristics by using SPSS 20 program and cross analysis (X2-test) independent sample t-test was conducted to verify homogeneity between the groups. The differences of pre/post self-directed learning ability, learning attitude and problem solving ability between the experimental group and the control group were analyzed by Paired t-test.

Sociodemographic characteristics of objects

Looking into sociodemographic characteristics of the research objects, women of the experimental group were 25 people (73.5%) and those of the control group were 30 people (85.7%), which indicated that the proportion of the female participants from the both groups was higher than that of males. More than 80% accounted for the age group between 21 and 23. 60% and more did not have a religion. Over 64% looked healthy and most of them had a complex personality type. 64.7% of the experimental group and 54.3% of the control group were satisfied with their major. Among the experimental group participants, 52.9% preferred a complex learning method, 35.3% preferred a lecture method and 5.9% preferred a problem solving method. In case of the control group, 54.3% preferred a lecture method, 34.3% preferred a complex learning method and 5.7% preferred a problem solving method. The level of prior knowledge was moderate for 63.9% of the experimental group participants and 80.0% of the control group (Table II).

Table II
Homogeneity of general characteristics of the groups

Characteristics	Categories	Cont. (n = 34)	Exp. (n = 34)	x^2	p
		n (%)	n (%)		
Sex	Men	9 (26.5)	5 (14.3)	1.583	.208
	Women	25 (73.5)	30 (85.7)		
Age (year)	21-23	28 (82.4)	31 (88.6)	.762	.449
	24-27	6 (16.2)	4 (11.4)		
Religion	No	22 (64.7)	24 (68.6)	.116	.733
	Yes	12 (35.3)	11 (34.3)		
Health	Healthy	22 (64.7)	23 (65.7)	.008	.930
	Normal	12 (35.3)	12 (34.3)		
Personality	Introverted	7 (20.6)	6 (17.1)	1.963	.375
	Extroverted	10 (29.4)	6 (17.1)		
	Complex	17 (50.0)	23 (65.7)		
Major Satisfaction	Satisfaction	22 (64.7)	19 (54.3)	.777	.378
	Dissatisfaction	12 (35.3)	16 (45.7)		
Preferred Learning Method	Lecture	12 (35.3)	19 (54.3)	2.445	.118
	Discussion	2 (5.9)	2 (5.7)		
	Complex	18 (52.9)	12 (34.3)		
	Problem solving	2 (5.9)	2 (5.7)		
Prior Knowledge	Much	6 (16.7)	7 (20.0)	.003	.953
	Moderate	23 (63.9)	28 (80.0)		
	Little	7 (19.4)	0 (00.0)		

Homogeneity examination of research objects

Before investigating the effects of the objects' self-directed learning ability, learning attitude and problem solving ability, a researcher checked the homogeneity of measurement area baseline between the groups. To do that, independent sample t-test was conducted for pre-test scores of each measurement tool and it was found that there was no significant difference between the experimental group and the control group in all measurement indexes, which proved these groups achieved the homogeneity (Table III).

Table III
Pre-test scores for the homogeneity

Variables	Groups	*M*	*S.D*	*t*	Sig.
Self-directed Learning Ability	Exp.(*n* = 34)	3.251	0.247	1.105	.273
	Cont.(*n* = 35)	3.168	0.372		
Learning Attitude	Exp.(*n* = 34)	3.278	0.372	-.486	.629
	Cont.(*n* = 35)	3.324	0.410		
Problem Solving Ability	Exp.(*n* = 34)	3.190	0.361	-1.712	.091
	Cont.(*n* = 35)	3.335	0.347		

The effects of women's health nursing STBL on self-directed learning ability, learning attitude and problem solving ability

To validate changes of the groups in the research attendees' self-directed learning ability, learning attitude and problem solving ability, matching sample t-test for pre/post variations was executed. Depending on the results, the self-directed learning ability of the experimental group was changed from pre-score (*M* = 3.251) to post-score (*M* = 3.312) and there was no significant difference in that of the control group, either. Moreover, the learning attitude of the experimental group was varied from pre-score (*M* = 3.278) to post-score (*M* = 3.360) and there was little change in that of the control group, either. However, it was analyzed that the problem solving ability of the experimental group significantly increased from pre-score(*M* = 3.190) to post-score(*M* = 3.584) ($p < 000$). It demonstrated that the problem solving ability of the experimental group participants was enhanced after the program intervention(Table IV).

Table IV
The effects of STBL on self-directed learning ability, learning attitude and problem solving ability

Variables	Categories	Exp. (*n* = 34)	Cont. (*n* = 35)	*t*	Sig.
		n (%)	*n (%)*		
Self-directed Learning Ability	Pre	3.251(.247)	3.168(.372)	-1.279	.209
	Post	3.312(.328)	3.205(.467)		
Learning Attitude	Pre	3.278(.372)	3.324(.410)	-.920	.365
	Post	3.360(.307)	3.318(.429)		
Problem Solving Ability	Pre	3.190(.361)	3.335(.347)	-3.999 ***	$p < 000$
	Post	3.584(.349)	3.286(.348)		

* $p < .05$

Discussion

This study was implemented for nursing college students and proved the effects of women's health nursing STBL on self-directed learning ability, learning attitude and problem solving ability. Among the pre-scores of the both groups, it was verified that the problem solving ability of the experimental group increased in the same circumstance, of which result showed on the other studies similarly (Choi & Park, 2014; Park et al., 2017). TBL excluded passive learning of lecture education and highlighted the education to involve learners in class. So, this is a learning method that a professor and learners can interact with each other briskly (Noh, 2013), which is being executed in medical and nursing learning activities. Students felt difficult in facing TBL at first, but as time passes, they could rediscover their learning ability and get accustomed to it accordingly (Lee & Jung, 2014). Although they found it difficult to prepare for discussion and learning process on their own, they could be gradually absorbed in the learning process by attending actively, widening responsibility for their team, achieving motivation and fulfilling accomplishment (Kang et al., 2013). In Roh et al. (2012) study, the average grades of the groups who participated in TBL were significantly higher than those of the individuals, so it revealed that it was more efficient to improve problem solving by studying in group than by studying individually.

This study was enlarged from the existing TBL by adding 3 stage processes. Students prepare at home and take an individual test before starting the program. Next, a speaker in a team presents prepared learning contents and team members ask questions and debate for review. After the presentation, a professor provides each team with post-tests. Team members solve questions through a group debate and submit the tests to the professor. At the end, the professor explains the test questions and summaries important contents. Through the process, mastery learning can be accomplished. In the prerequisite learning stage, various knowledge and information which students find and acquire by means of Internet, textbooks, clinical experience, distance education can be a ground of raising problem solving ability (Roh et al., 2012).

Self-directed learning exerts a strong influence on academic achievement. Continuous desires and capability are highly required to acquire knowledge and skills personally in the clinical field (Yang & Moon, 2007). Self-directed learning was not significant in this study but increased significantly in other studies Chae & Hwang (2009); Noh (2013). It was seen to have a high correlation with job satisfaction, organizational commitment, clinical practice capability (Noh, 2013; Murad et al., 2010). Self-directed learning is an important element to train good women health nursing resources and its notion needs to keep being realized according to change of education. In this study, they can review through member's presentation and discussion in the TBL course after home study preliminarily. Lastly, a professor summarizes to help diverse students increase their accomplishment.

Learning attitude is a crucial emotional factor to affect learning. Positive learning attitude can maximize learning effect (Merisuo, 2007). Also, active attitude and responsibility for self-control are necessary requisites for learners (Lin, 2017). Learning attitude was not significant in this study but significant in other studies (Park et al., 2017). One team was set within 5 members and a computer was installed on a round table for a debate class. In the process of team presenting and debating actively, a professor observed the team process status consistently and provided prompt feedback. The biggest influence factors of TBL satisfaction are team leadership, trust, problem solving ability (Noh, 2013) and it is highly recommended that the professor continuously controls the team learning process and

monitors achievement of individuals and groups. Women's health nursing STBL, which was supplemented from the existing TBL, has been developed to be a program of easily accessible to the nursing education field. The enhancement of problem solving ability found in this study will enable students to do self-directed learning.

Limitations and Future Research Directions

This research was conducted only at a college of a region. Therefore, it will be necessary that women's health nursing STBL should be operated and confirmed continuously in various environments and the effect of the program operation should be repeatedly investigated throughout the whole semester to assess its effectiveness. Hence, future research in this domain is encouraged.

Conclusion

In this study, women's health nursing STBL was operated for 50 minutes per week over 6 weeks in total. This is a quasi-experimental research to verify the effects of the program. It examined how self-directed learning ability, learning attitude and problem solving ability have changed. As a result, there was a significant effect of women's health nursing STBL on problem solving ability statistically for the 6 weeks. However, there was no significant effect on self-directed learning ability and learning attitude. From the research results, it proved that women's health nursing STBL enabled learners to use their activity and initiative. Of course, it should be provided with instructor's passion and proper feedback on students' level. Recently, infertile women are increasing due to late marriages, so outstanding women health nursing resources are decreasing. Hopefully, the research results can be used as baseline data of nursing education and enhance problem solving ability of nursing students. If the problem solving ability of women nursing professional manpower increases, the quality of nursing will be able to improve accordingly.

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